
CITY OF MESA
UTILITIES DEPARTMENT
RESOURCES DIVISION

WATER RESOURCES
MASTER PLAN
SEPTEMBER 2004



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PLAN OVERVIEW AND PURPOSE

The requirements of the Groundwater Management Act combined with rapid population growth have made the task of providing a safe, reliable and economical water supply to the City of Mesa water service area a complex undertaking. Development and use of Mesa's water resources must be carefully planned to meet the needs of an expanding economy and an increasing population.

The Mesa Water Resources Plan is designed to support the mission of the City of Mesa, which is to provide superior services to our customers in order to improve the quality of life for Mesa residents, businesses, and visitors, and also to support the mission of the City of Mesa Utilities Department, which is to be dedicated to customer service and to continually strive for improvement of customer satisfaction through efficient, professional service.

This Water Resources Plan includes updated water demand and supply projections, updated information on supply development, reclaimed water management, water conservation programs, and supply shortages. In addition, this Plan recommends actions needed to provide adequate, reliable, and economical water supplies for the future.

The demand forecasts used in this Plan are those developed by Black and Veatch for use in the 2004 Water Master Plan. Black and Veatch developed a baseline measure of water use per land use category, and then applied this factor to the future land use categories envisioned in Mesa's General Plan 2025. Projections are thus consistent with Mesa's overall general planning efforts.

BACKGROUND

HISTORY OF MESA'S WATER UTILITY

According to the Public Works Record, Waterworks Report of 1969, Mesa's first public water system consisted of a community well and watering trough on Main Street.

Later, a small pipeline was run to several buildings along the street. In 1904, P.E. Fuller applied to the Town Council for a franchise to operate a private water system to serve the town. Approval for this was not forthcoming, and in 1910, the Council established a Water Works Board. A \$150,000 bond issue was used to construct the first major waterworks improvements. Before the establishment of Mesa's Water Department, the citizens of Mesa obtained drinking water from the canals or from wells that they, or their neighbors, dug themselves.

THE GROUNDWATER MANAGEMENT ACT

Groundwater levels in the Phoenix-Mesa metropolitan area have been adversely impacted by historic overuse of groundwater. Overuse of groundwater has several negative consequences, the most significant of which to a city's economy is an unreliable water supply. During the mid 1900s, as Arizona cities evolved from an agricultural to an urban economy, policy makers became increasingly concerned about the adequacy of water supplies to support the state's growth.

After several earlier failed efforts, in 1980 water users came together to develop a comprehensive groundwater management plan, known as the Arizona Groundwater Management Act of 1980.

The Arizona Department of Water Resources (ADWR) administers and enforces the Groundwater Code. The highest level of management, with the most restrictive provisions, is applied to Active Management Areas (AMAs) where groundwater overdraft is most severe. The Phoenix area AMA was established in 1994. The goal of the Phoenix AMA is safe-yield by 2025. Safe-yield is a term that means a long-term balance between the amount of groundwater withdrawn in the AMA and the amount of natural and artificial recharge.

The Groundwater Code places restrictions on cities' use of groundwater. These restrictions were put in place with the goal of eliminating cities' reliance on pumping more groundwater than is naturally replaced or artificially recharged. As a result of

these restrictions, Mesa has increased its use of renewable surface water supplies relative to non-renewable groundwater supplies.

SPATIAL ASPECTS OF SUPPLY, DEMAND, AND INFRASTRUCTURE

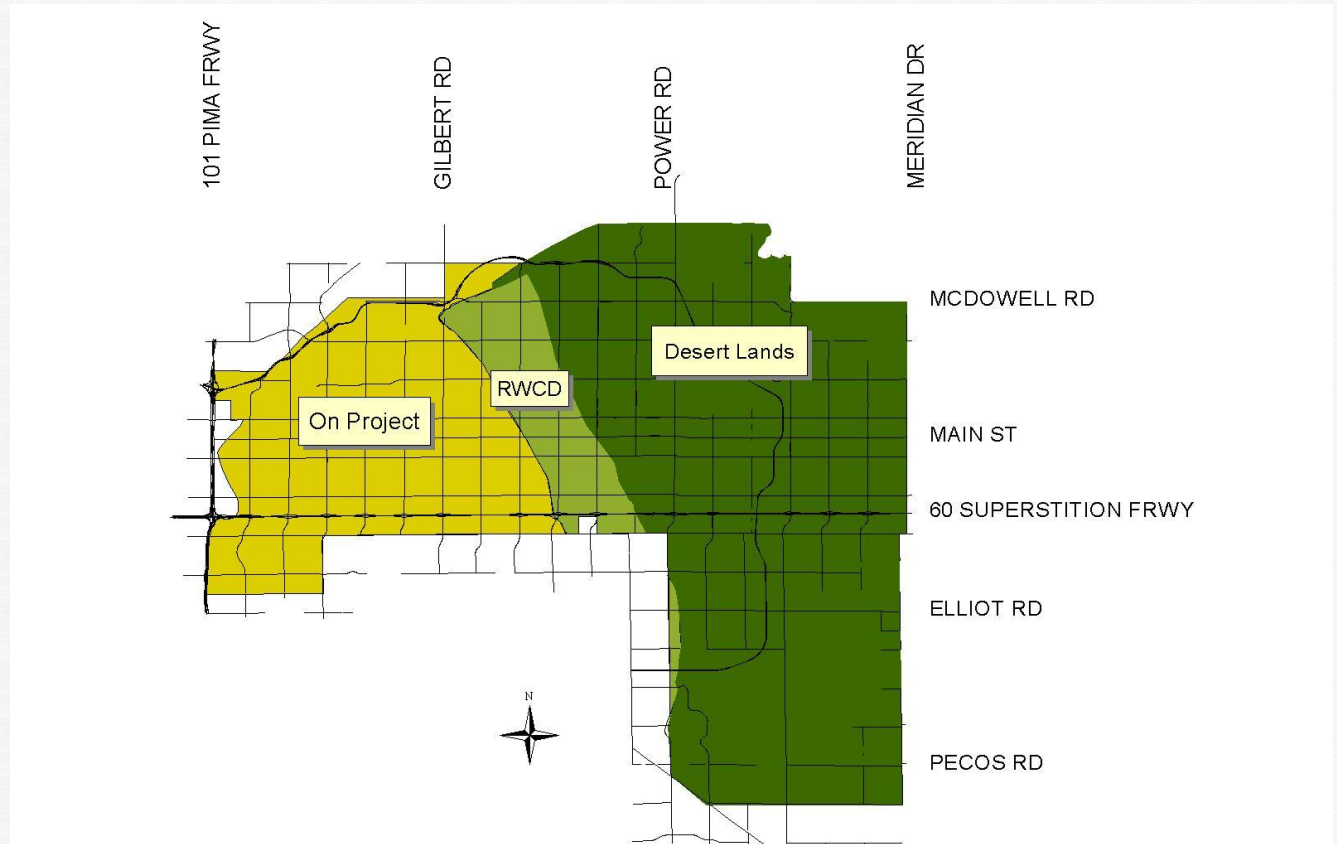
It is useful to take a closer look at the spatial aspect of water demand, water supply, and infrastructure in the Mesa service area. Analysis in this Plan is mostly broken down by the spatial difference between On Project versus Off Project lands.

The lands within the Mesa service area that fall within the boundaries of the Salt River Project (SRP) have access to surface water from the Salt and Verde Rivers through the SRP system. This area is referred to as being “On Project.” The term “Off Project” describes the lands outside of these boundaries.

The discrimination between On Project and Off Project lands is important mainly because the water available through SRP can only be used on lands that are located On Project. Demand characteristics are also different On Project versus Off Project, and different infrastructure serves On Project versus Off Project lands.

Off Project lands are occasionally broken down even further for more detailed analysis. The lands within the Mesa service area that fall within the boundaries of the Roosevelt Water Conservation District (RWCD) also have access to Salt and Verde River water, but not enough to meet full demand. To meet customer demand within RWCD, Mesa must supplement the RWCD surface water supplies with other supplies. The lands outside of both SRP and RWCD boundaries are referred to as “Desert” lands because of their lack of access to Salt and Verde River waters. Demand, supply, and infrastructure characteristics also vary between RWCD and Desert lands, and therefore analysis is sometimes further broken down to inspect these differences.

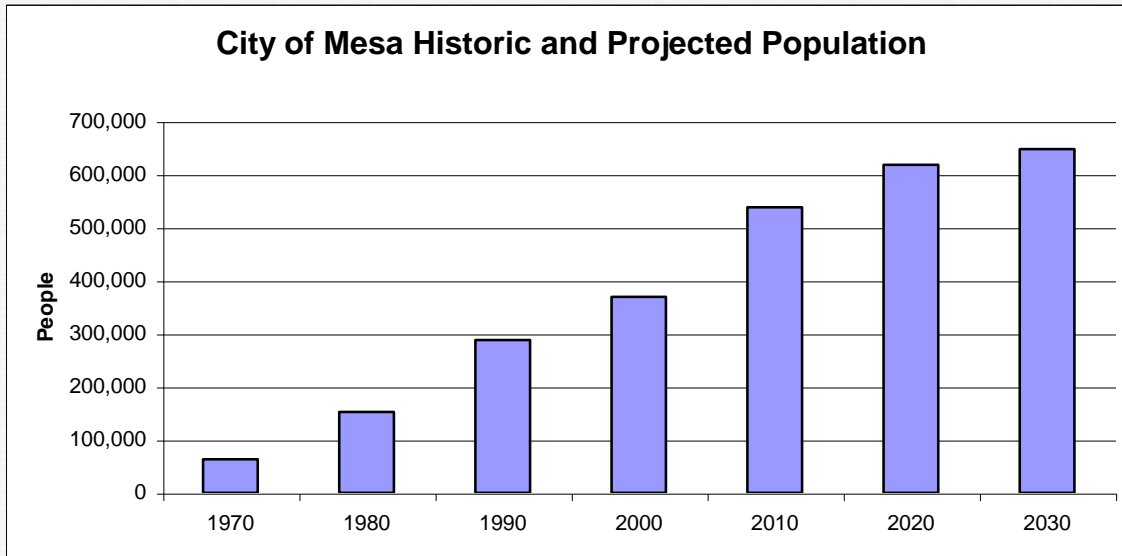
The map below represents Mesa's current water service area broken down into On Project, RWCD, and Desert lands.



HISTORIC AND PROJECTED GROWTH

Chart 1.1 shows Mesa's historic and projected population.

Chart 1.1



WATER RESOURCES MISSION AND WATER DEVELOPMENT POLICIES

The mission of the Water Resources section of the Utilities Department is to ensure the current and future reliability of high-quality water supplies for the City of Mesa water service area in the most efficient manner possible while balancing social, economic, and environmental impacts of water resources development.

The mission of the Water Conservation section of the Utilities Department is to develop and promote a progressive water conservation program that provides people of all ages the information and inspiration needed to conserve water.

To integrate and support these missions, the sections jointly developed policies regarding:

- Water supply and infrastructure development
- Reclaimed water use
- Groundwater use
- Artificial recharge

-
-  Water demand management
 -  Social and environmental considerations
 -  Drought management planning

These policies, discussed below, guide the development of the Water Resources Plan.

WATER SUPPLY AND INFRASTRUCTURE DEVELOPMENT

1. Develop sufficient supply sources and infrastructure capacity to provide reliable, high-quality water supplies to the City of Mesa water service area during years of normal water supply availability.
2. Develop sufficient supply sources and infrastructure capacity to provide for normal demands, with voluntary water conservation programs in place, during times of drought and water system outages.
3. Develop a robust water resources portfolio of sufficient diversity to provide resource redundancy to minimize the chance of interruptions in water service caused by evolving legal, regulatory, environmental, natural, or other restrictions on the development or use of any particular supply source.
4. Develop and maintain infrastructure that supports the goal of a diverse water resources portfolio.
5. Develop and maintain water treatment, water reclamation, and distribution system redundancy to minimize the chance of water outages due to breakdowns or malfunctions.
6. Develop the supplies and infrastructure mentioned above in the most efficient manner possible.
7. Analyze alternative water supply and infrastructure development projects using an integrated least-cost planning principle.

RECLAIMED WATER

1. Continue to develop and use reclaimed water as an integral part of Mesa's water resources portfolio. Continue to develop and maintain the necessary infrastructure.
2. Maximize efficient development and use of reclaimed water, giving due consideration to water quality, public acceptability, and cost.

GROUNDWATER MANAGEMENT

1. Use groundwater in a manner consistent with the goals of the Arizona Groundwater Management Act.
2. Develop and maintain reasonable groundwater table elevations over the long-term throughout the service area through both well operation and artificial recharge.
3. Operate wells with the primary purpose of meeting customer needs but with the secondary purpose of managing water table elevations and, where appropriate, contaminant plumes.
4. Cooperate with local water provider partners in developing a regional aquifer management plan through the efforts of the East Valley Water Forum.

WATER DEMAND MANAGEMENT

1. Comply with conservation goals established by the 1980 Groundwater Management Act.

-
2. Continue to develop, expand, and enhance water conservation education programs for youth, residential, corporate, and multi-family water users.
 3. Continue to encourage the water conservation ethic through mass marketing of conservation tips, strategies, and policies.
 4. Promote efficient outdoor water use by encouraging the installation of Xeriscape landscape with education, demonstration, and financial incentives.
 5. Promote the use of technological advances to eliminate waste and reduce water use.
 6. Continue the City of Mesa's commitment to demonstrate leadership in water conservation.

SOCIAL AND ENVIRONMENTAL CONSIDERATIONS

Balance social, economic, and environmental concerns in the planning, acquisition, treatment and distribution of water resources by including environmental and social benefits and costs in the analysis of alternative projects.

OVERVIEW OF MESA DEMAND CHARACTERISTICS

Mesa supplied approximately 96,000 acre-feet of water in 2003 and served over 450,000 people in its water service area.

At present, single-family uses constitute just over half of Mesa's demand. Another 18 percent comes from multi-family uses such as apartment complexes and mobile home communities. The remainder—29 percent—is made up from commercial uses. In 2003 Mesa consumed around 175 gallons per capita per day (GPCD).

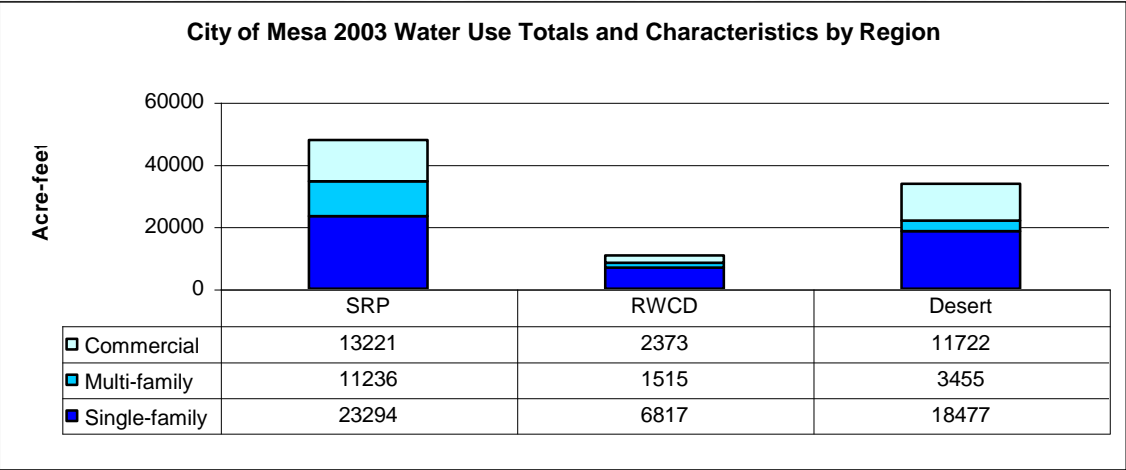
Nearly 52 percent of Mesa's water demand occurs within the SRP boundaries, while only 11 percent occurs within RWCD boundaries. The remaining 37 percent occurs in Desert lands.

The SRP, RWCD, and Desert regions have access to different water resources, consume different amounts of water, and have different water use characteristics. The differences in consumption and water use characteristics are shown below in Chart 3.1.

As can be discerned from the chart, the SRP and Desert regions support relatively large commercial uses. Only in the SRP region is multi-family use substantial, though

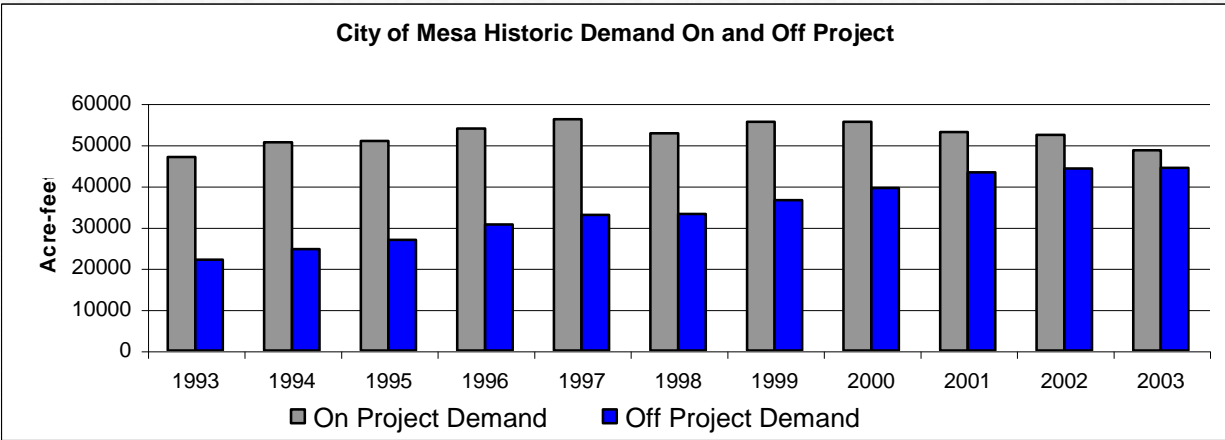
the other regions may see an increase in multi-family use as empty lots in these areas develop.

Chart 3.1 Water Use by Region



Currently, On Project demand is around 52 percent of total demand in the City of Mesa. The historic difference in On Project versus Off Project demand is shown in Chart 3.2 below. While On Project demand has remained relatively stable over the last 10 years, Off Project demand has more than doubled.

Chart 3.2 Historic Demand

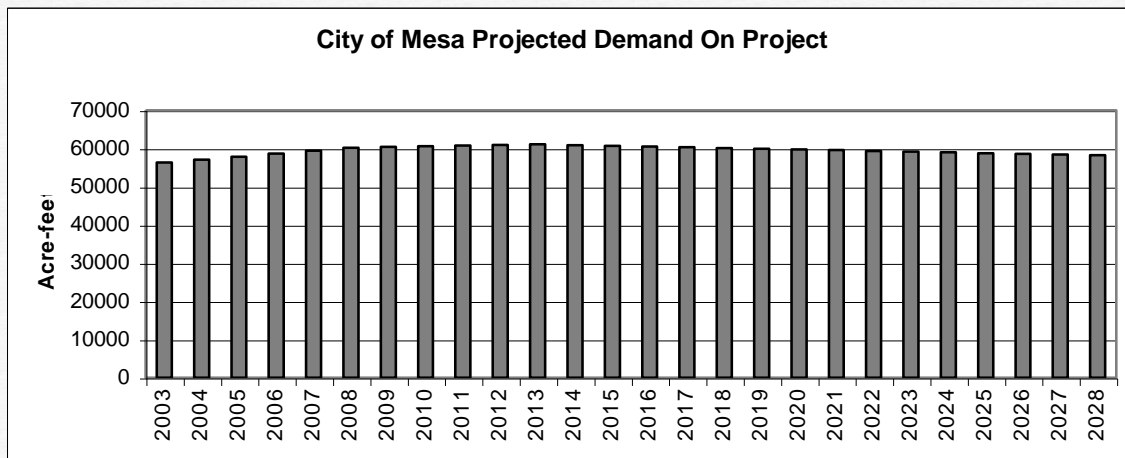


SUPPLY AND DEMAND ON PROJECT

PROJECTED DEMAND ON PROJECT

As can be seen in Chart 4.1 below, it is predicted that demand On Project will remain relatively stable over the next 25 years.

Chart 4.1 Projected Demand On Project



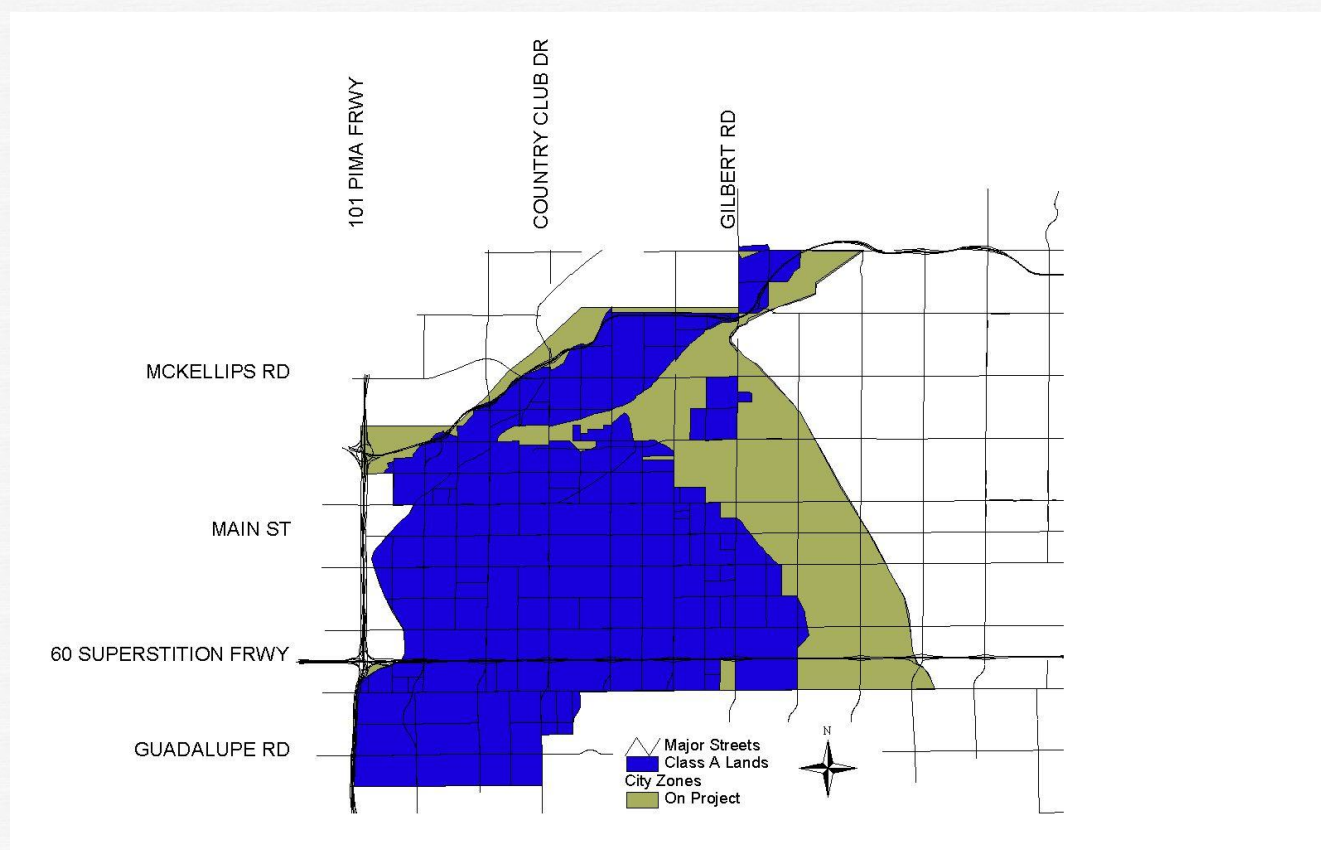
ON PROJECT SUPPLY DURING A NORMAL YEAR

Water from the Salt River Project

Mesa is blessed with an abundance of land within its water service area that has rights to water from SRP. SRP water primarily comes from six reservoirs located on the Salt and Verde Rivers. These reservoirs receive water from precipitation that drains from a 13,000-square-mile watershed. Water is released from these reservoirs, where it is later diverted for use by several Valley municipalities, farmers, and other smaller water users. SRP also augments its surface water supplies with about 250 groundwater wells, which are used when enough surface water is not available. The majority of SRP water received by Mesa is treated to drinking water standards at the Val Vista Water Treatment Plant (WTP) located at Lindsey and McDowell roads.

Rights to SRP water are appurtenant to certain lands within the Salt River Valley Water Users' Association (SRVWUA). The term "appurtenant" means that, with few

exceptions, the rights to the water stays with the land that it is attached to, and cannot be moved to or used on other land. Therefore, while Mesa is fortunate to have approximately 20,000 acres of land that carries with it rights to SRP water On Project, this water cannot be used anywhere but on the land to which the rights are appurtenant. In most years, Mesa is entitled to more SRP water than it can use on those Mesa lands that have SRP water rights. A map of Mesa lands within the SRVWUA is shown below.



The amount of SRP water to which municipalities are entitled is difficult to quantify because the amount changes each year based on the quantity of water stored in SRP reservoirs, and the current and projected flows of the Salt and Verde Rivers. However, in most years, a municipality is entitled to three acre-feet per acre, most of which is surface water. In addition to this entitlement, a municipality may also be entitled to receive another surface water type from SRP called “Normal Flow,” which is only made available to those lands with the more senior water rights attached to them (referred to as “Class A” lands).

Class A lands are the most valuable within the SRVWUA with regard to water rights because these lands have rights to stored surface water and Normal Flow water. Normal Flow water is allocated to Class A lands based on a formula established by the U.S. District Court in Maricopa County in 1910. Of the approximate 20,000 acres of SRP lands in Mesa that have water rights attached to them, approximately 14,000 acres are Class A lands.

Mesa is also entitled to two legal forms of groundwater from SRP. First, of the three acre-feet per acre of water usually allocated to members in a normal year, one acre-foot per acre is usually pumped groundwater, called “Developed” water. Second, Mesa is entitled to approximately 25,000 acre-feet per year of “Special Pump Right” water. Special Pump Right water is groundwater from the SRP system that can be delivered to the City of Mesa. In most years, groundwater from SRP is not valuable to Mesa because by the terms of the Groundwater Code, any groundwater that Mesa uses must be replenished on an acre-foot per acre-foot basis. However, this supply may become quite valuable during times of surface water supply reduction caused by drought.

At present, assuming a normal water supply year, Mesa is entitled to up to about 46,000 acre-feet of stored surface water, up to about 20,000 acre-feet of groundwater, about 16,000 acre-feet of Normal Flow water, and approximately 25,000 acre-feet of Special Pump Right water. Current demand for SRP water from Mesa SRVWUA lands is approximately 56,000 acre-feet per year.

In the early 1990’s, the Valley municipalities and SRP assisted in the development of a storage and recovery program that allows municipalities increased flexibility in making use of their SRP surface water supplies. Under this program, a municipality may deliver some of its SRP water to the Granite Reef Underground Storage Project (GRUSP) where it is artificially recharged into the aquifer. The municipality is then assigned an Annual Storage and Recovery (AS&R) credit for each acre-foot recharged. The AS&R credits must be recovered through permitted municipal wells within the same month that the water was recharged and the water must be used on SRVWUA lands. Mesa takes advantage of this program to continue to use SRP surface water during times

that the Val Vista WTP or the SRP canal system are unavailable due to maintenance or other reasons.

The amount of Salt and Verde River water to which Mesa is entitled through the Salt River Project is for the most part a fixed amount that is projected to change very little over time. As mentioned previously, SRP water is appurtenant to the land. Mesa gains access to the water when the landowner cuts over his portion of SRP water to the City so that the City can in turn serve this water to the landowner through the municipal water delivery system. Legally, this transfer of water occurs through a contract between SRP and Mesa called the Water Delivery and Use Agreement. Some landowners have not cut over their portion of SRP water to the City and instead receive direct and untreated water deliveries from SRP.

Mesa can gain greater access to SRP water only if more landowners cut over their water rights to the City. Given that most landowners in Mesa have already done so, there is little anticipated change in Mesa's future legal access to SRP water. Mesa's Water Delivery and Use Agreement with SRP expires in the year 2101.

During normal years, Mesa has access to ample SRP water supplies to meet customer demand On Project both now and in the foreseeable future. In addition, Mesa's capacity at Val Vista WTP is adequate to treat enough surface water to meet baseline and peak demands. Mesa has substantial well capacity located On Project, and these wells provide system redundancy when Val Vista WTP is unavailable due to maintenance or other problems.

Groundwater Credits

Supplies throughout Mesa's service area are supplemented by Mesa's access to Groundwater Allowance and Long-term Storage Credits, which can be used from any designated "recovery" well within Mesa's water service area.

In 1995 cities designated with a 100-year assured water supply were provided with an initial Groundwater Allowance, use of which was determined to be consistent with the Groundwater Code and the goal of safe yield. An amount equal to 5.35 percent of Mesa's total water use is added to the Groundwater Allowance account each year, which equals

an amount of water presumed to be recharged incidentally throughout the City's service area each year. As of the end of 2003, Mesa's Groundwater Allowance account contained approximately 572,000 acre-feet.

Long-term Storage Credits are created through the artificial recharge of surface water. For each acre-foot of CAP water it recharges, Mesa receives .95 acre-feet in CAP Long-term Storage Credits. For each acre-foot of reclaimed water it recharges, Mesa receives one acre-foot in reclaimed water Long-term Storage Credits. As of the end of 2003, Mesa has approximately 313,000 acre-feet of CAP Long-term Storage Credits and 52,000 acre-feet of reclaimed water Long-term Storage Credits

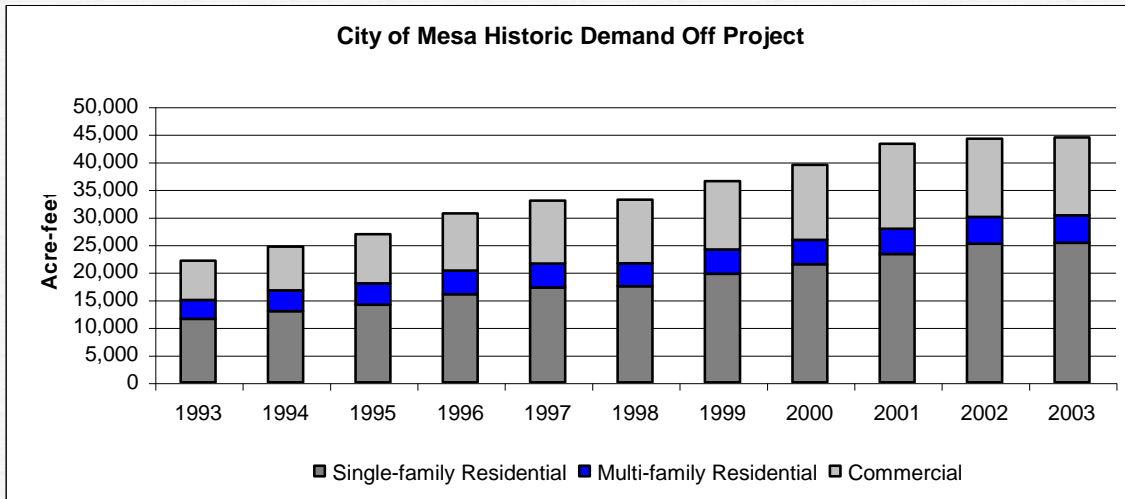
With the exception of a certain amount of groundwater use during times of surface water drought, any water pumped from wells (excluding AS&R water), and any water received through the SRP system that is legally counted as groundwater (allocated groundwater or Special Pump Right water) must be replenished by debiting either the Groundwater Allowance or Long-term Storage Credit accounts.

OFF PROJECT DEMAND AND SUPPLY

CURRENT AND HISTORIC DEMAND OFF PROJECT

As shown below in Chart 5.1 Off Project demand has more than doubled over the last 10 years. Demand within RWCD lands has increased by 110 percent and demand within the Desert zones has increased by 150 percent. Nearly two-thirds of the water used in the RWCD zone goes to single-family uses. Commercial use of water is relatively higher in the Desert region compared to the RWCD region.

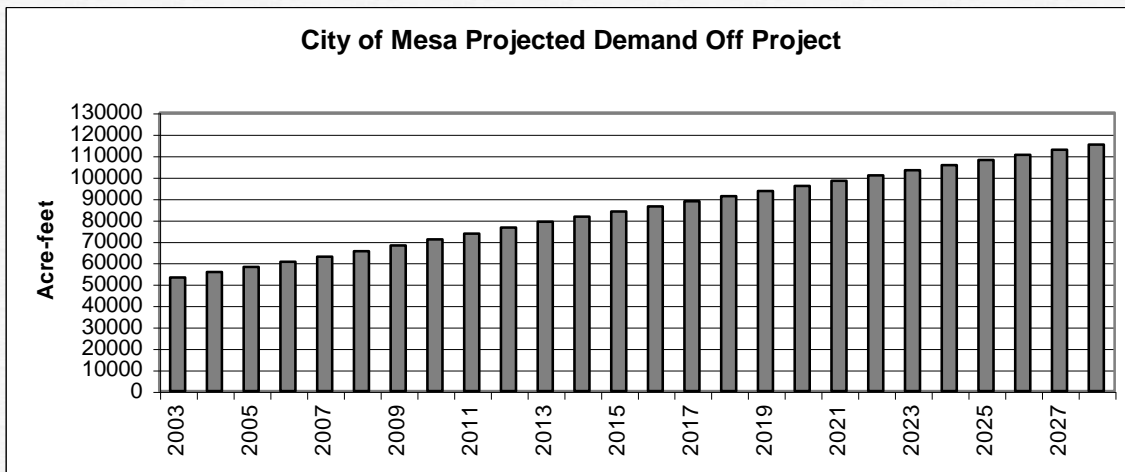
Chart 5.1 Off Project Historic Demand



PROJECTED DEMAND OFF PROJECT

As can be seen in Chart 5.2 below, it is predicted that demand Off Project will increase by 130 percent in the next 25 years.

Chart 5.2 Off Project Projected Demand



OFF PROJECT SUPPLY AND DEMAND DURING A NORMAL YEAR

Colorado River Water from the Central Arizona Project

Mesa's second-largest source of surface water is delivered through the Central Arizona Project (CAP), operated by the Central Arizona Water Conservation District

(CAWCD). The CAWCD pumps water from the Colorado River at Lake Havasu for delivery to Maricopa, Pinal, and Pima Counties. Among the Lower Colorado River Basin water users, the priority of the CAP entitlement is last. This means that Nevada, California, and various towns and cities on the Colorado River are entitled to take their water before the CAP allocation can be diverted. Priorities on the Colorado River are important because they dictate how much water each user can divert during times of Colorado River water shortage.

While all water currently delivered through the CAP is physically the same—Colorado River water—the water that Mesa receives through the CAP differs in price, legal title, and priority. Currently, Mesa has access to Subcontract water, Wellton-Mohawk water, Hohokam water, Salt River Pima-Maricopa Indian Community (SRPMIC) Lease water, RWCD Assignment water, Incentive water, and Excess water through the CAP system. Most water received through the CAP system is treated to drinking water standards at Mesa’s Brown Road CAP Water Treatment Plant, and can be used anywhere in the Mesa water service area.

Subcontract Water

In 1984, Mesa entered into a Subcontract with the Bureau of Reclamation and the CAWCD to receive what is called Municipal and Industrial (M&I) Priority water. M&I Priority water has a priority equal to that of Indian Priority water, and together the two classes of water comprise the highest priority water in the CAP system. Currently, Mesa is entitled to 36,388 acre-feet of M&I Priority water.

Wellton-Mohawk Water

Mesa owns rights to 2,761 acre-feet per year of Wellton-Mohawk Irrigation District water. The Wellton-Mohawk Irrigation District is located on the Colorado River near Yuma. Wellton-Mohawk water has a priority higher than that of CAP water.

Hohokam Water

In December of 1993, Mesa signed another Subcontract with the Bureau of Reclamation and the CAWCD for delivery of what is called Hohokam water. Hohokam water is CAP Agricultural Priority water originally contracted to the Hohokam Irrigation and Drainage District in Pinal County. The Secretary of the Interior later transferred this water to the cities of Chandler, Mesa, Phoenix, and Scottsdale as replacement water for a dam that was planned but never completed. Agricultural Priority water has a priority lower than that of M&I Priority water. However, in the year 2043 the water offered under this subcontract converts to M&I Priority.

The amount of Hohokam water available to Mesa varies from year to year depending on the available supply of CAP Agricultural Priority water. In 1999, Mesa received 17,663 acre-feet of Hohokam water, but the amount available to Mesa will decline over time to approximately 4,900 acre-feet in 2043.

SRPMIC Lease Water

As part of the Salt River Pima-Maricopa Indian Community water settlement, Mesa leases 1,669 acre-feet per year of SRPMIC Indian Priority water. The lease expires in 2098.

RWCD Assignment Water

Also as part of the SRPMIC water settlement, Roosevelt Water Conservation District transferred 627 acre-feet of its Agricultural Priority water to the City of Mesa.

Excess Water

CAP Excess water is the water left over after M&I, Indian, and agricultural users have scheduled their CAP water. The CAWCD markets this water to anyone in Arizona with a use for it. Mesa does not currently contract for Excess water.

Incentive Water

As part of its effort to move water off of the Colorado River and make use of Arizona's full entitlement to CAP water, the CAWCD currently offers water used for artificial recharge at a discount rate. The amount of water available varies year by year. This water can be used only for recharge purposes and is delivered directly to the recharge partner or facility.

Mesa makes use of this relatively inexpensive source of water through partnerships with SRP and RWCD at their Groundwater Savings Facilities (GSF). Mesa purchases the Incentive water and the water is in turn delivered directly to the GSF partner. The GSF partner uses this water in lieu of pumping groundwater. Five percent of the water used by the GSF partner is credited to the aquifer, as a "cut to the aquifer." The Department of Water Resources assigns 95 percent of the water used by the GSF partner to the City of Mesa in the form of Long-term Storage Credits. These credits can be recovered—or pumped from any recovery well—at any point within the area of hydrogeological impact, at any time. Long-term Storage Credits basically amount to water in the bank. Currently, Mesa has approximately 313,000 acre-feet of Long-term Storage Credits from CAP water.

Water from Roosevelt Water Conservation District

Mesa also receives water from land that carries with it rights to water from the Roosevelt Water Conservation District (RWCD). RWCD is a public taxing authority that overlies parts of Mesa, Chandler, and Gilbert and was originally established for agricultural irrigation purposes. Through an arrangement with SRP in which RWCD lined portions of the SRP canal in exchange for surface water, RWCD gained entitlement to water from the Salt and Verde River watersheds. As lands within RWCD have urbanized, the surface water that was used by irrigators has been cut over to the City for municipal use. Mesa's allocation of RWCD water is treated to drinking-water standards at the Val Vista Water Treatment Plant.

Just as SRP water can only be used on SRVWUA lands, RWCD water can only be used on RWCD lands. There are approximately 8,000 RWCD acres within the City of Mesa water service area.

The amount of RWCD water to which municipalities are entitled is also difficult to quantify because the amount changes year by year based on the flow of the Salt and Verde Rivers. In most years, Mesa is entitled to approximately four-tenths of an acre-foot of surface water and four-tenths of an acre-foot of groundwater for each acre of land within RWCD. All lands within RWCD are entitled to the same amount of water.

In most years, Mesa is entitled to about 2,400 acre-feet of surface water and 2,400 acre-feet of groundwater from its lands within RWCD. Current demand for water within the Mesa RWCD lands is approximately 9,400 acre-feet per year. The difference between the amount of surface water received from RWCD and the demand within RWCD is made up from Mesa's other Off Project supplies, including CAP water and Long-term Storage Credits. Because the Groundwater Code requires that all groundwater received from RWCD be replenished, Mesa orders only surface water from RWCD.

Salt and Verde River Water from New Roosevelt Conservation Space

In 1986, the United States, the CAWCD, Maricopa County Flood Control District, SRP, Chandler, Mesa, Phoenix, Scottsdale, Tempe, and the State of Arizona, reached agreement on funding for an increase in capacity to Roosevelt Dam. In exchange for its monetary contribution, Mesa is entitled to 15 percent of the capacity in New Roosevelt Conservation Space (NCS), up to a maximum of just over 38,000 acre-feet per year.

The NCS is located at nearly the top of Roosevelt Dam, and because the years since completion of the project have been dry ones, Mesa has never received any water from this project. However, it is anticipated that in future years, Mesa will receive an average of 11,000 acre-feet per year. NCS water can flow through the SRP system to the Val Vista Water Treatment Plant or to GRUSP for recharge purposes. This water can be used anywhere in Mesa's water service area.

Reclaimed Water

Mesa currently produces approximately 13,000 acre-feet of reclaimed water every year at its Southeast and Northwest Water Reclamation Plants. Because public acceptance of drinking reclaimed water is extremely low, Mesa's present uses for reclaimed water are limited to non-drinking-water purposes.

Mesa employs reclaimed water directly by delivering it to turf facilities such as golf courses. One thousand acre-feet are currently under contract for turf facility use and additional reclaimed water will be used for landscaping purposes along the 202 Freeway.

Reclaimed water can also be recharged artificially into the aquifer and recovered as groundwater for later use. This use of reclaimed water is called a "recharge and recovery" strategy. By this method, reclaimed water is recharged either directly into the aquifer or is delivered to a GSF partner. In either case, Long-term Storage Credits are created. Later, the Credits are "cashed in" or recovered by pumping groundwater from a permitted recovery well. The groundwater that is pumped in place of the reclaimed water maintains the same legal classification as reclaimed water. Mesa has approximately 52,000 acre-feet of Long-term Storage Credits for reclaimed water.

In 2002, Mesa signed an agreement with the Gila River Indian Community through which Mesa will exchange its reclaimed water for the Community's CAP water. Mesa will deliver up to 29,400 acre-feet of water to the Community, which will use the water for irrigation purposes. In exchange, Mesa will receive up to 23,530 acre-feet of CAP water that can be used as part of Mesa's potable water supply. In effect, the exchange allows Mesa to convert a non-drinking water supply of water into a potable supply.

Most of Mesa's raw sewage, approximately 35,000 acre-feet per year, is sent to the City of Phoenix for treatment at the 91st Avenue Wastewater Treatment Plant (WWTP). By existing contract, reclaimed water from this plant is used for cooling purposes at the Palo Verde Nuclear Power Plant and for agricultural purposes in the Buckeye Irrigation District. Mesa receives some financial reimbursement for this water but does not receive Long-term Storage Credits. It is anticipated that in the future Mesa will receive Long-

term Storage Credits for at least a portion of the water delivered to 91st Avenue WWTP because the water will be recharged in a facility to be developed in the Agua Fria riverbed.

Groundwater Credits

The Groundwater Allowance and Long-term Storage Credits discussed previously can be used anywhere within the Mesa service area, and so are available to Off Project as well as On Project lands.

Pinal County Water Farms

In 1985 Mesa purchased nearly 12,000 acres of land in Pinal County, referred to as the Pinal County water farm, for the purpose of capturing the groundwater rights appurtenant to the land. Through this purchase, Mesa has acquired approximately 28,000 acre-feet per year of groundwater rights in Pinal County.

Mesa does not currently make use of this water directly. Instead, the lands have been leased back to farmers, who use the water rights for their crops and pay the groundwater tax directly to the Department of Water Resources. It was anticipated that when Mesa has need for this water a water exchange arrangement would be made with the City of Tucson or some other CAP user further south. Mesa would use a portion of Tucson's CAP water at the Brown Road Water Treatment Plant. In exchange, Mesa would pump its Pinal County groundwater into the CAP canal for delivery to Tucson. At this time, Mesa has no need for this water and no legal or physical arrangements have been made for such an exchange.

Projected Supply and Demand in a Normal Year

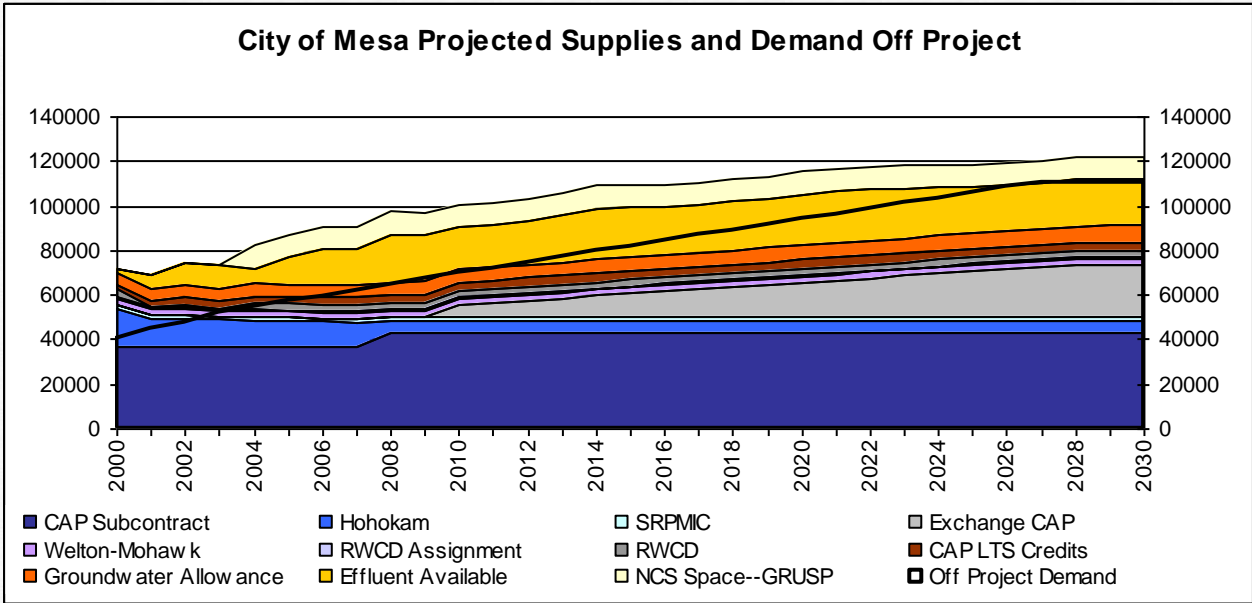
Projected demand and supplies Off Project are shown in Chart 5.3 below. There are three important points to be made from this chart. First, assuming that Mesa's growth does not dramatically outpace that expected in Mesa's general plan, Mesa can reasonably expect to meet future demand with the existing water resources portfolio and

without developing the Pinal County water farm or acquiring additional resources.

Second, Mesa’s ability to meet future demand is nearly entirely dependent on its ability to make efficient use of its reclaimed water resources. Third, approximately 25 percent of Mesa’s renewable supplies ultimately will be supplies that are physically available only through wells. This means that Mesa will need to maintain enough well capacity to pump enough water to meet at least 30,000 acre-feet of demand every year at buildout.

Moreover, most of this water will need to be pumped to supply Off Project demands. The need to pump 30,000 acre-feet of water does not include extra groundwater supplies that might need to be pumped during times of surface water shortage.

Chart 5.3 Off Project Projected Supply and Demand



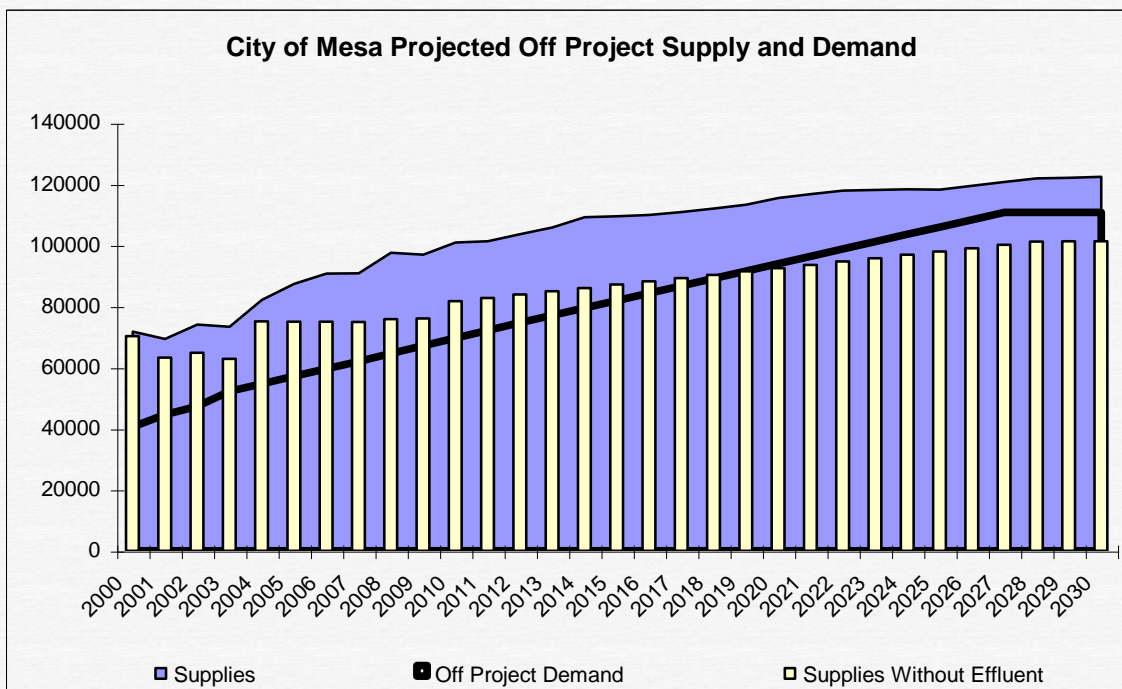
MEETING FUTURE DEMAND AND MANAGEMENT ISSUES

While it appears as though Mesa has access to the supplies necessary to meet build-out demand, there are several obstacles to success and Mesa must manage its resources with great care. In this section, these obstacles are examined and recommendations are made regarding the efficient and careful management of Mesa’s water resources.

Management of reclaimed water

Chart 5.4 below indicates that without efficient development of reclaimed water supplies, Mesa will be unable to meet future demand. Efficient development of reclaimed water supplies necessitates collection of wastewater, treatment of the wastewater to a very high standard, and then eventual use through either direct deliveries or recharge and recovery.

Chart 5.4 Off Project Projected Supply and Demand



Reclaimed Water from the Northwest Water Reclamation Plant

Treatment capacity at the Northwest Water Reclamation Plant (NWWRP) is 18 million gallons per day, but inflows are significantly less, and the plant produces approximately 7,500 acre-feet of reclaimed water per year. Reclaimed water from the NWWRP is used directly to water landscaping along the 202 Freeway and is recharged at a recharge facility located across from the plant on the south side of the Salt River (the South Ponds). Originally, Mesa intended to deliver reclaimed water from the NWWRP into the Roosevelt Water Conservation District (RWCD) canal for storage in the RWCD

Groundwater Savings Facility for generation of Long-term Storage Credits. A dispute arose over the discharge of this water into the RWCD main canal and as part of the eventual settlement Mesa agreed to abandon the idea. As the existing recharge ponds do not have adequate capacity to recharge all of the flows from the NWWRP, the result has been that a portion of the NWWRP reclaimed water is discharged into the Salt River. Mesa receives no Long-term Storage Credits for the water.

To remedy the situation and ensure efficient use of NWWRP reclaimed water, Mesa is completing a line from the plant to the Granite Reef Underground Storage Project where Mesa can recharge the water and receive Long-term Storage Credits. In addition, Mesa is pursuing more direct deliveries of the water to Riverview Golf Course, Longbow Golf Course, and possibly Mesa Country Club. Ultimate reclaimed water discharge from the NWWRP is projected to be around 16,500 acre-feet of water per year, and it is expected that recharge capacity at the South Ponds and at GRUSP will be adequate to handle all of these flows.

Reclaimed Water from the Greenfield Water Reclamation Plant

Mesa, Gilbert, and Queen Creek are jointly developing the Greenfield Water Reclamation Plant (GWRP) located at Greenfield and Queen Creek Roads in Gilbert. Mesa's initial treatment capacity will be four million gallons a day, building ultimately to around 24 million gallons a day. It is expected that all of the flows from the GWRP will be delivered by pipeline to the Gila River Indian Community in fulfillment of Mesa's obligations under the Reclaimed Water Exchange Agreement with the Community. The Community will use the water for agricultural purposes and Mesa will use the CAP water received in exchange for potable purposes.

Reclaimed Water from the Southeast Water Reclamation Plant

Management of reclaimed water from the Southeast Water Reclamation Plant (SEWRP) is the most challenging. Mesa has only limited options of either disposal or beneficial use of reclaimed water from the SEWRP. Originally it was intended that all of

the reclaimed water from the plant would be discharged into the RWCD main canal, and several agreements between Mesa and RWCD reflect this intention. As mentioned above, however, Mesa and RWCD subsequently had a disagreement regarding the discharge of reclaimed water into the RWCD main canal. As part of the settlement reached, Mesa agreed to stop discharge of reclaimed water from the SEWRP into the RWCD main canal by December 31, 2014. In addition, beginning on January 1, 2010, Mesa must pay RWCD \$20 per acre-foot if Mesa continues to discharge into the canal. In short, then, Mesa has a strong incentive to find alternative means of making efficient use of reclaimed water from the SEWRP. Reclaimed water flows from the SEWRP are expected to ultimately reach around 11,500 acre-feet per year.

To ensure efficient use of reclaimed water from the SEWRP, Mesa is building a pipeline from the SEWRP to the GWRP that will ultimately connect to the pipeline that will deliver reclaimed water to the Gila River Indian Community. It is expected that reclaimed water from the SEWRP, in addition to reclaimed water from the GWRP, will be needed to meet the reclaimed water exchange obligations with the Community. The amount of water from the SEWRP needed for delivery to the Community varies over time depending on flows from the GWRP, but in some years all of the flows will be needed and in other years very little. Therefore, Mesa will need a place to recharge water from the SEWRP that is not delivered to the Community. The possibility of recharge in the East Maricopa Floodway is currently being explored.

Other options include increased sales of the reclaimed water to nearby golf courses, exchanges with the town of Gilbert, and increases in the amount of reclaimed water delivered to the Community in exchange for CAP water. Most important, however, is that Mesa develop the physical infrastructure necessary to make use of the reclaimed water before January 1, 2010, when a \$20 per acre-foot charge for use of the RWCD canal applies.

Reclaimed Water from the 91st Avenue Water Treatment Plant

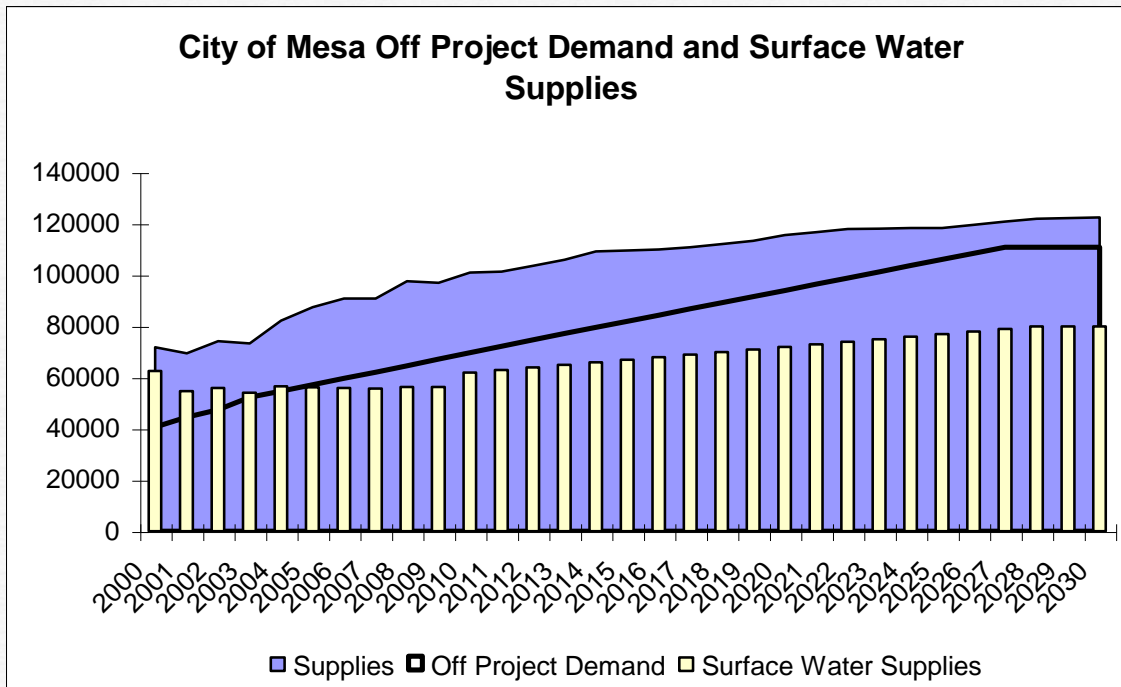
Mesa currently sends around 30,000 acre-feet of wastewater to the 91st Avenue plant. Mesa must continue to send some amount of wastewater to meet its portion of the reclaimed water obligations to the Palo Verde Nuclear Power Plant, Buckeye Irrigation District, and others. However, it is theoretically possible for Mesa to reduce wastewater flows to 91st Avenue down to their minimum and reclaim the water for beneficial use in Mesa, instead. The Sub-Regional Operating Group, a group of cities that owns and operates the 91st Avenue Plant, is also looking at recharging reclaimed water in excess of committed obligations. In either case, it is important that Mesa make beneficial use of the reclaimed water from 91st Avenue that is available beyond the committed obligations, and Mesa should continue to look for opportunities to use the water from 91st Avenue in a manner that can be counted towards its Assured Water Supply.

Management of Mesa's reclaimed water is one of the most complex, challenging, and important issues in planning for Mesa's water resources portfolio.

Adequate Well Capacity

Chart 5.5 below indicates that while Mesa has adequate supplies to meet projected demand, ultimately Mesa will have limited access to supplies available as surface water and will need to rely increasingly on supplies available through wells such as Long-term Storage credits, NCS water, and the Groundwater Allowance. Moreover, as mentioned previously, during times of drought surface water supplies will be even scarcer and even more pumping capacity will be necessary. Therefore, it is vital that Mesa maintain well capacity adequate to meet demand during both normal and drought periods.

Chart 5.5 Off Project Demand and Surface Water Supplies



Protecting Legal Availability of Supplies

There are many legal threats to Mesa's future water supply availability, and staff from both the Water Resources section and City Attorney's Office spends significant time dealing with these legal issues.

Indian Community Water Rights Claims

Because Arizona's water rights are based on prior appropriation (first in time, first in right), Indian communities often have very strong claims to surface water in Arizona that pre-date cities' rights to water. Because the threat is substantial, Valley cities dependent on surface water have worked for more than 30 years to settle these claims as amicably as possible for both sides. To date, settlements with the Salt River Pima-Maricopa Indian Community, Fort McDowell Indian Community, and San Carlos Apaches have been achieved. A settlement with the Gila River Indian Community is expected in the next few years, and settlement negotiations with the White Mountain Apache Tribe may begin soon. Indian water rights settlements provide an alternative to years of court action that can be enormously time consuming and expensive. Further,

settlements reached between parties are usually more mutually beneficial than court decrees.

There are still several tribes with potential claims on Mesa's surface water with whom no settlement has been reached. To protect its water supplies, Mesa must continue to engage in discussions and settle claims where possible.

The Gila River Adjudication

Pending before Arizona's Superior Court are unresolved water rights claims to waters of the Gila River system, which include the Verde, Salt, and all other tributary rivers. All water rights claims filed by water users both upstream and downstream of Mesa have the potential to reduce Mesa's entitlement to surface water. The adjudication also has the potential to limit the amount of groundwater that Mesa can pump from wells located near the Salt River, because groundwater from these wells may be declared to be appropriable subflow of the river itself. Although the adjudication is moving along, it does not appear as though any water rights will be determined anytime in the next decade. In the meantime, the threat to Mesa's water supplies through Verde River basin development grows.

In the next few years Mesa will need to revise its statements of claim with the court, an extremely time-consuming undertaking. Legal matters regarding the adjudication are currently being handled mainly by outside counsel that is hired in partnership with three other cities, Chandler, Scottsdale, and Glendale. While this arrangement has afforded Mesa a relatively inexpensive way to keep up with the multiple filings and orders, eventually the interests of the four cities in the adjudication will diverge because of differences in physical location relative to the Salt River, differences in water use patterns, and other important variables.

Verde River Basin Development

Population growth in Payson, Camp Verde, and Prescott has exploded. As of the year 2000, population in these communities had increased by 150, 115, and 65 percent

respectively. Population is expected to double again by 2030. Most of the water used by these communities is groundwater taken from the river alluvium or aquifers that feed into the Verde River system. The amount of water that runs into the SRP reservoirs may be greatly diminished by the water use in the Verde Valley, and this potentially has negative impacts on Mesa's water supply portfolio. Any reduction in base flow of the Verde River would have its most deleterious impacts during times of drought.

In theory, were the Gila River adjudication to ever move forward, water rights in the Verde River would be determined, and those surface water and groundwater users that are impacting senior rights downstream would be forced to find alternative supplies. SRP has concerns with the pace of the adjudication, however, and recently filed an injunction against some of the most egregiously "illegal" water uses in the Verde Valley. Mesa must continue to monitor Verde River Basin issues including the SRP lawsuit, and participate in the Gila River adjudication.

The Colorado River

Various tribes along the Colorado River, including the Hopi and Navajo, have claims to the river that are complex and uncertain. Because the CAP holds the lowest priority on the Colorado, all of these claims have the potential to impact CAP water and therefore Mesa's supply portfolio. Mesa must monitor these developing claims diligently.

The ongoing drought on the Colorado River has stressed water supplies throughout the West, and many cities, including Denver and Las Vegas, are currently in much worse condition in terms of water supply than is the Phoenix-Mesa metropolitan area. Las Vegas, Denver, and others are putting pressure on the legal mechanisms that control the use and management of the Colorado River, called the "Law of the River." Certain interests would like to see substantial changes in the Law of the River in terms of allocations, management, priorities, and transfers. All of these changes have the potential to either greatly benefit or harm the CAP and Arizona's entitlement to Colorado River water. Currently, discussions among interested Arizona parties are beginning to determine the optimal management of the River from a statewide perspective. With this

recommendation in hand, a group of state representatives will negotiate with other Colorado River basin state representatives to work out management of the river through the ongoing drought and over the next several years. Mesa must remain proactively involved in these efforts.

Another potential threat to Arizona's Colorado River entitlement and to the CAP arises out of the environmental needs of the river. It is not currently known how much water will be needed to serve environmental and endangered species issues on the Colorado. It is also not known where the water for these purposes would come from. A large effort involving all basin states and the federal government is underway, called the "Multispecies Conservation Program," or MSCP for short. The MSCP is an attempt to cooperatively fund and manage endangered species issues on the Colorado in a comprehensive manner. However, most environmental groups have walked away from the table so the future of the MSCP, or whether it will fulfill the needs of the Endangered Species Act before a court of law, is unknown.

Moreover, many environmentalists believe that the U.S. must take responsibility for restoration of the Colorado River delta and for maintenance of the Cienega de Santa Clara in Mexico. Others have argued that it is Mexico's responsibility and one to which the Mexican government is capable of dedicating necessary resources should it choose to do so. However, the issue remains outstanding as a threat to Arizona's Colorado River water. Of particular threat is the Cienega de Santa Clara.

The United States' treaty with Mexico regarding the delivery of Colorado River water includes both water quantity and water quality standards. The United States owes Mexico approximately 1.5 million acre-feet a year of Colorado River water that meets certain salinity requirements at Morelos Dam on the border.

The Yuma Desalting plant was built by the Bureau of Reclamation (BOR) and designed to desalt drainage return flows from the Wellton-Mohawk Irrigation and Drainage District (Wellton-Mohawk) prior to their release into the Colorado River near Morelos Dam. The plant was necessary to ensure that the United States met its water quality obligation to Mexico.

The plant has never operated as was planned. Instead, Wellton-Mohawk's salty drainage water, on the order of 100,000 acre-feet per year (an amount approximately equal to Mesa's total annual water demand), has been bypassed around the plant since 1977 and delivered through a canal to the Cienega de Santa Clara in Mexico. The Cienega has since become an important environmental habitat. Because this water does not meet the correct water quality standards and is not delivered at Morelos Dam as required by the treaty with Mexico, the water does not count towards the United States' treaty obligation to Mexico and becomes essentially free water to Mexico.

The problems with delivering "free" water to Mexico are many, but of particular concern to CAP water users is that this represents 100,000 acre-feet of water that, if the desalter were operated as planned, would still be behind reservoirs on the Colorado providing added protection against shortage on the Colorado River. Because the CAP has the lowest priority on the River, it is CAP water users who are at greatest risk of shortage.

Operation of the desalter would cut flows to the Cienega by around 70 percent and the water's saltiness would increase more than 200 percent, effectively destroying the habitat over some period of time. Environmentalists have lobbied hard to prevent operation of the desalter. The BOR also is not particularly anxious to operate the desalter because of the cost.




To counter CAP water users' concerns about loss of 100,000 acre-feet that could otherwise have been stored behind the reservoirs, environmentalists have suggested that 100,000 acre-feet of water could be saved and left behind the reservoirs by instituting a farmland fallowing program. Enough agricultural land would be left fallow that water orders would be 100,000 acre-feet less than otherwise would be the case. Unfortunately, Arizona is the place where land fallowing is most likely to take place. In effect, then, this proposal would in all likelihood replace the lost 100,000 acre-feet of water delivered to the Cienega by reducing Arizona's overall access to Colorado River water from 2.8 million to 2.7 million. This doesn't seem like a very good deal for Arizona.

The easiest and most logical way to preserve the environmentally important Cienega is for Mexico to agree to count the water deliveries to the Cienega as part of the United States' water obligation to Mexico. However, Mexico is unlikely to do so as it has water shortage problems of its own and most likely cannot afford to dedicate so much water to an environmental rather than municipal or agricultural cause. The issue is complex and difficult, but should be resolved without CAP and other Arizona water users bearing most of the burden.

Conservation as a Source of Supply

The City of Mesa has actively promoted water conservation for more than 20 years, as a way to stretch existing water supplies, minimize the need for costly water supply projects, and maximize sustainability in meeting future water needs. The conservation efforts have largely advocated a lifestyle or behavior change – accepting that we live in the desert, realizing that water resources are scarce, and putting into practice wise water use habits.

The City can meet water demands by acquiring an additional water supply, but it is usually the case that meeting the demand through conservation is less costly. Water conservation is a means to lower demand, thereby potentially preventing the need to:

-  Acquire and develop water resources.
-  Develop and construct new water supply, treatment and delivery facilities and infrastructure.
-  Develop and construct new wastewater treatment facilities and infrastructure including delivery and disposal facilities.

The Utilities Department is initiating an Integrated Least Cost Planning (ILCP) process to augment the current water master planning and wastewater master planning processes. ILCP will identify the optimal combination of demand-side management programs, supply-side resources, and infrastructure and facilities that will allow the City to meet or exceed its goal of delivering safe, reliable, and economical water and wastewater services to its customers. ILCP also includes a financial assessment of the

various combinations of demand side management and supply side options. This process helps to assess whether demand-side management programs, including enhancements to our existing conservation programs, allow for reducing the size and quantity of, deferring, or obviating the need for expensive water resource acquisition and infrastructure development.

Looking to water conservation as a means to meet demand is especially important during times of drought when extraordinary and expensive water supply and infrastructure changes are necessary to meet customer demand. It is believed that Mesa's existing water conservation program has been successful in deferring the need for water resource acquisition and infrastructure development, and that more intensive efforts may be financially justified for the future due to increasing competition for expensive water supplies and potential climate change.

Working Cooperatively

The acquisition of water supplies and the development of the infrastructure necessary to make use of the supplies entail tremendous economies of scale. It is much more economical for cities to pursue water supplies and build necessary infrastructure in a cooperative manner. Mesa has long had a philosophy of taking advantage of these economies of scale whenever possible, and has cooperative arrangements regarding resources and infrastructure with literally every one of its neighbors, including Chandler, Gilbert, Apache Junction, Queen Creek, the Gila River Indian Community, the Salt River Pima Maricopa Indian Community, Roosevelt Water Conservation District, SRP, and Arizona Water Company.

Mesa was instrumental in creating a grass-roots regional water planning group known as the East Valley Water Forum, or "EVWF." The EVWF was developed as a forum through which water providers can work together cooperatively, discuss regional water issues, and learn from one another's experience. The EVWF has created a water infrastructure map that, it is hoped, will better enable members to identify opportunities to partner in infrastructure development. The forum is also developing an East Salt

River Valley Groundwater Management Plan, based on input from local water providers and a hydrogeologic model developed by the Arizona Department of Water Resources. In the future, the EVWF hopes to develop a cooperative model to guide water providers through years of shortage on the CAP. Mesa should continue its involvement in the EVWF.

DROUGHT

Mesa has planned well to meet future water demands under normal circumstances. However, Mesa and much of the greater Southwest are currently experiencing drought conditions. Mesa's ability to meet demand under drought conditions is examined in this section.

ON PROJECT DEMAND AND SUPPLY DURING DROUGHT PERIODS

Supply Reductions Due to Drought

Supply reductions on the SRP system due to drought have fortunately been rare. Unfortunately, as of 2001 until the writing of this Plan in 2004, Mesa has been experiencing a surface water supply reduction from SRP caused by an ongoing drought.

Supply reductions due to drought cause physical, legal-institutional, and financial impacts. These impacts are explained for a supply reduction on the SRP system.

Physical Impacts

Mesa is currently experiencing an SRP surface water supply reduction caused by the worst drought on historical record. However, Mesa is not experiencing an overall SRP water supply reduction. Mesa has replaced the lost SRP surface water with a category of groundwater rights from the SRP system called Developed water discussed above. Furthermore, because Mesa takes delivery of its SRP water very high up on the SRP canal system, nearly all of the water delivered to Mesa is physically surface water, not groundwater. What this means is that even when Mesa is taking delivery of

groundwater from SRP, it is being delivered physically as surface water and the impact is therefore invisible to Mesa water supply infrastructure.

As explained above, Mesa is entitled to nearly 110,000 acre-feet of water from the SRP system during a normal year, while demand is only around 56,000 acre-feet. Moreover, Mesa received nearly 10,000 acre-feet of Normal Flow water in 2002, a year when watershed runoff into the SRP system was only two percent of normal. Mesa is also entitled to Special Pump Right water whether there is a drought or not. Added together, this means that for Mesa to actually experience a physical decrease in total SRP water supplies available for delivery, SRP water supplies would have to be cut from their normal of three acre-feet per year to less than one acre-foot per acre. Given that SRP has enough well capacity to pump approximately one acre-foot per acre groundwater allocation for all of its 250,000 acre member land service area, the chances of Mesa experiencing an overall supply reduction from SRP are remote.

Even were Mesa to experience a physical supply reduction of SRP supplies, Mesa has enough well capacity On Project to meet two-thirds of peak customer demand.

Legal-Institutional and Financial Impacts

The legal-institutional impacts of an SRP supply reduction caused by drought are more substantial. When Mesa replaces lost SRP surface water supplies with SRP groundwater or Special Pump Right supplies the use of what is legally called groundwater must be replenished by Mesa. This means that the water use must be replenished by debiting either Mesa's Groundwater Allowance account or Mesa's Long-term Storage Credit account on an acre-foot per acre-foot basis.

In 2003, Mesa debited its Groundwater Allowance account by more than 20,000 acre-feet because of the ongoing drought. Mesa can also expect to debit this amount every year until the volume of water in the SRP reservoirs increases substantially.

SRP surface water is the least expensive source of water available to Mesa. Special Pump Right water is currently around \$23 more per acre-foot than surface water, and therefore has negative financial implications to the City, when used as a

replacement source for surface water. However, use of CAP water as a replacement can be just as expensive if not more.

Although there is no out-of-pocket cost to the City when its Groundwater Allowance or Long-term Storage Credit accounts are debited, there may be a future cost because ultimately those credits may need to be replaced for Mesa to maintain its assured water supply designation. It is not expected that Mesa will need to replace any of these credits by the year 2010, when Mesa must reapply for its designation, but it is possible Mesa would need to replace these credits at some later time depending on population growth and future water use levels. In the event that Mesa needs to repay debited Credits, water conservation programs may be enhanced to offset or avoid some of the costs of applying for and meeting the Assured water supply requirements.

OFF PROJECT DEMAND AND SUPPLY DURING DROUGHT PERIODS

CAP Supplies and Drought

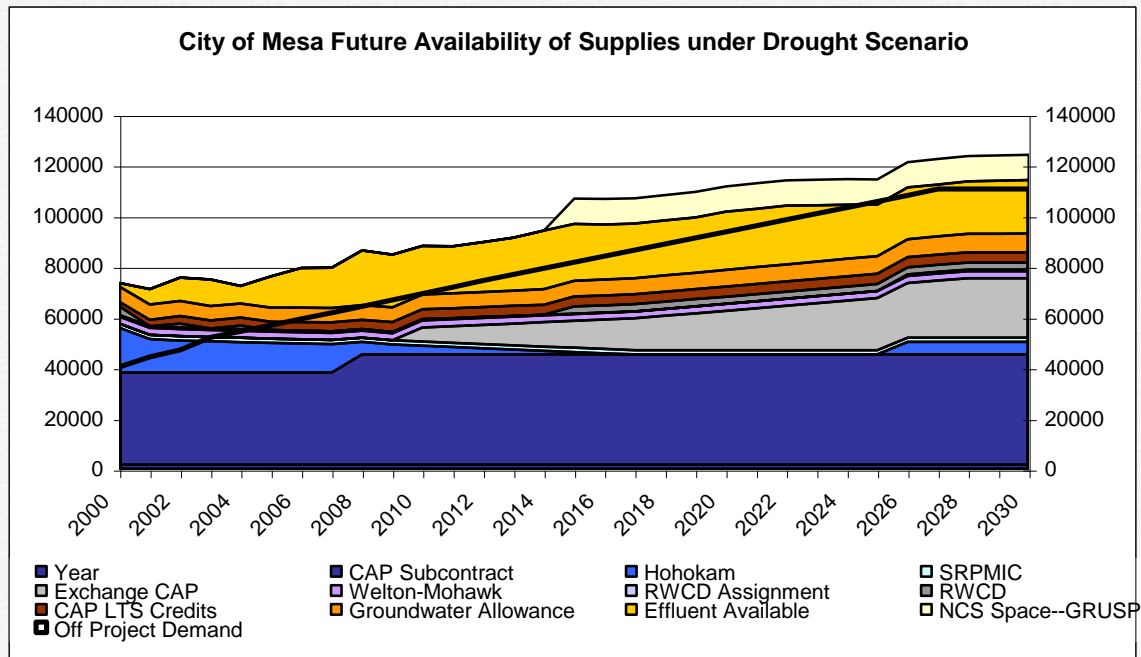
The supplies Mesa receives through the CAP system vary in their vulnerability to drought on the Colorado River. Hohokam water and RWCD Assignment water have an agricultural priority on the CAP system and would be cut before cuts were made to subcontract and SRPMIC lease water. Wellton-Mohawk water has a higher priority than CAP water and would be the last to be cut. It is expected that GRIC exchange CAP water would not be cut during a drought.

The Arizona Water Banking Authority (AWBA) was created in 1996 with the goal of making full use of Arizona's Colorado River water. The AWBA was created in part to store unused Arizona Colorado River water to meet the needs of municipal and industrial CAP users in times of shortages or disruptions of the CAP system. The AWBA is working towards the goal of storing enough CAP water underground to firm 20 percent of the amount that CAP water is shorted to municipal and industrial subcontractors. How this water will be recovered for use during times that CAP M&I water is short is currently unknown. Some of the water may be delivered as "wet water" through the CAP canal the same as CAP water deliveries. Some of the water may also be delivered as

“paper water” in the form of Long-term Storage Credits that are allocated among the CAP M&I subcontract holders. Because some of the water may be delivered as Long-term Storage Credits that need to be recovered, Mesa needs to be sure to maintain well capacity ample to meet shortage year requirements as well as normal year demands.

The Bureau of Reclamation and the Arizona Department of Water Resources recently ran their model of Colorado River operations using a 17-year “worst case” scenario. The amount and timing of CAP shortages is somewhat discretionary, based on the outcome of negotiations with the other states that share the Colorado River basin. These projections show that the earliest a 500,000 acre-foot CAP shortage would occur is 2009. A 500,000 acre-foot shortage in 2009 cuts into excess water uses and a small amount of agricultural priority water uses, but a cut into M&I supplies would not occur for several more years because many cities are not yet using their full entitlement to CAP water. The projections also show that if Arizona opted to undertake an 800,000 acre-foot CAP shortage, such shortage would not occur until 2012, and is also expected to cut into excess and agricultural water uses, but not municipal uses. In other words, Mesa is not likely to experience a shortage in CAP water during the next 10 years at least. If and when cuts to CAP water do happen, the credits stored by the AWBA will help mitigate the effects of the cutback. Chart 6.1 shows Mesa’s projected supply and demand during a drought in which CAP agricultural priority water is cut, and RWCD and NCS water are unavailable.

Chart 6.1 Future Availability of Supplies



RWCD Supplies and Drought Vulnerability

RWCD gave up 8,000 acre-feet of water to the Salt River Pima-Maricopa Indian Community water rights settlement and another 3,200 acre-feet of water to the Fort McDowell Indian Community water rights settlement. This water has a super priority compared to other water right interests in RWCD. That is, these communities receive all of their water off of the RWCD system before Mesa is entitled to any of its RWCD water. RWCD water available to Mesa, already sensitive to drought on the Salt and Verde River system, is therefore even more sensitive to drought because of these settlements. During 1998, a year of relatively high runoff, the allocation of RWCD water was around .7 acre-feet per acre. By 2002, after years of drought, the allocation had fallen to .19 acre-feet per acre.

NCS Supplies and Drought Vulnerability

Because NCS water is received only when Roosevelt Dam is nearly full, no NCS water is expected to be available during times of drought on the Salt River system.

Groundwater Credits

Groundwater credits, either from the Groundwater Allowance or Long-term Storage Credits, are inherently drought proof, since the water is banked underground until needed.

During times of drought on the Colorado River system, Mesa can expect to lose its RWCD Assignment and Hohokam CAP water supplies, or approximately 5,550 acre-feet. Other CAP supplies, firmed by the AWBA, may only be available through wells, and not at the surface water treatment plants.

During times of drought on the SRP system, Mesa can expect to lose its NCS water and RWCD surface water, or approximately 14,000 acre-feet. However, NCS space water is expected to be recharged and not used directly, so its loss in any given drought year is not a loss of surface water used directly but rather a lost opportunity to accumulate Long-term Storage Credits.

City of Mesa Drought Plan

Mesa's City Council adopted a new drought management plan in the fall of 2003. The purpose of this Drought Management Plan is to endorse a management framework for:

- dealing with drought conditions when they occur,
- preventing the need to implement drastic demand reduction measures such as rationing of water supplies, and
- planning for future drought conditions before they occur.

The City of Mesa Drought Management Plan complements ongoing water resource and water operations planning efforts and is designed to be a flexible tool to plan for, mitigate, and respond to drought conditions. At the heart of the Drought Management Plan is the Drought Management Team (Team). It is the responsibility of the Team to evaluate the severity of droughts and develop an action plan based on current and forecasted water supply and demand, and economic impact to the City.

The Drought Plan contains four stages of drought response that can be declared by the Mesa City Council, each containing increasingly strict water conservation measures.

Because of the current drought conditions and the cutback in the availability of SRP surface water supplies, Mesa is currently in Stage One of its Drought Plan. Drought responses in Stage One include:

- Increased monitoring by Water Resources of SRP and CAP surface water supply availability.
- Reporting by Water Resources to the Manager of the Utilities Department, the City Manager, and the City Council as water supply conditions change.
- Increased community education on water conservation.
- Encouragement of HOA's, apartment communities, owners and managers of large turf facilities to not overseed in the fall, and
- Reduction of water use in City facilities, including but not limited to reduction of hours of operation of water features, and limits on overseeding.

Should SRP combined deliveries of Stored and Developed water be cut to less than 1.5 acre-feet per acre and / or CAP Subcontract and Indian Lease water availability be cut to an amount that is equal to or less than eighty percent of the amount of Subcontract and Indian Lease water used in the most-recent non-drought year, Mesa would enter into Stage Two of the Drought Plan. During Stage Two, In addition to the measures implemented during a Stage One event, one or more of the following demand management measures may be requested of all water customers:

- Reduce water consumption 5–10% by eliminating waste, repairing leaks, and eliminating unnecessary outdoor water use.
- Run lawn sprinklers only between the hours of 7:00 PM to 7:00 AM.
- Turn off decorative water features and outdoor misting systems
- Forego overseeding in the fall.
- Increase cooling tower cycles to three cycles of concentration or higher.
- Reduce frequency of outdoor watering.

At this time, Mesa is well prepared to continue operations under drought conditions and it is not anticipated that Mesa will have a need to enter into Stage Two.

SUMMARY

The demand for water Off Project will more than double by build out. While it appears as though Mesa has the water resources necessary to meet demand now and in the future, efficient management and continued protection of Mesa's water resources are vital to ensuring Mesa's water future. Mesa must continue work towards maximizing its use of reclaimed water resources, and must ensure that it has adequate well capacity Off Project to make use of water resources that will only be available through wells both in normal and in drought years.

Legal protection of Mesa's water portfolio is sure to become more challenging in the future as the Gila River adjudication and development in the Verde Valley move forward and competition for scarce water resources intensifies. Mesa should move into a more proactive and strategic position regarding management of Gila River adjudication issues.

Most of the surface water available to the East Salt River Valley has already been allocated. The opportunities in the future for increased efficiency in water resources development will be limited, and available mostly through better partnerships with surrounding entities. Mesa should continue its role as leader in East Valley cooperative infrastructure development, and should continue to participate actively in the East Valley Water Forum and other relevant venues.